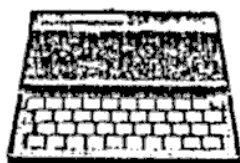


LIST

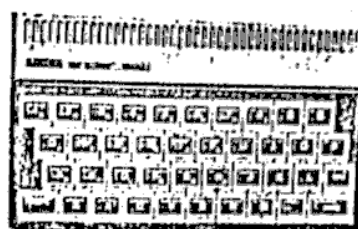
LONG ISLAND SINCLAIR TIMEX GROUP
INCORPORATING * NYTSE OF NEW YORK CITY
ISSUE: FEBRUARY 1990

* NEW YORK TIMEX SINCLAIR ENTHUSIASTS: NEXT MEETING MARCH 11, 1990

LIST MEMBERSHIP IS \$15.00. LIBRARY TAPES ARE AVAILABLE, WRITE THE ADDRESS PRINTED BELOW.



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L.I.S.T.
5 PERI LANE
VALLEY STREAM, NY
11581

TO:

FIRST CLASS MAIL
DATED MEETING NOTICE

UPPER RIGHT
CORNER OF
YOUR LABEL
IS DATE OF
LAST ISSUE.



LIST OFFICERS

PRES. HARVEY RAIT
TRES. ROBERT MALLOY
REC. SEC. STEVE KAYE
EDITOR. FRED STERN
LIBR. TOM SKAPINSKI

PLEASE SEND INQUIRIES TO:

LIST

MR. HARVEY RAIT

5 PERI LANE

VALLEY STREAM, N.Y. 11581

PLEASE SEND SUBMISSIONS TO:

LISTING

MR. FREDERIC STERN

314 ROBERTS ST.

HOLBROOK, N.Y. 11741

NYTSE

NYTSE MEETS THE MONDAY AFTER
THE LIST MEETING AT:
MISS KIMS RESTAURANT
PARK AVENUE SOUTH
BETWEEN 21 ST. AND 22 ST.
MEETINGS START 7:30 PM.

COMING EVENTS

MARCH 11, 1990 LIST MEETING
MARCH 12, 1990 NYTSE MEETING

MEETING MINUTES
FEBRUARY 11, 1990

HARVEY CALLED THE MEETING TO
ORDER AT 2:15 PM.

LAST MONTH WE REPORTED THAT
OL WORLD WAS ENDING PUBLICATION
BY ERROR. QUANTUM LEVEL IS
ENDING PUBLICATION.
MY APPOLIGIES TO ALL.

BOB GILDER REPORTS THAT HUGO
DI GIOVANNI WAS MOVED TO
WOODBURY NURSING HOME
JERICHO TURNPIKE
WOODBURY N.Y.

B WING
A CARD OR A VISIT WILL GREATLY
HELP IN HUGOS RECOVERY

STONEY REPORTED THAT TRENTON
STATE COLLEGE REFUSES TO HOST
THE COMPUTER FEST THIS YEAR.
THE AMATEUR COMPUTER GROUP OF
N.J. WHO ORGANIZES AND SPONSERS
THE COMPUTER FEST. IS LOOKING
FOR AN ALTERNATE SIGHT.

A DISCUSSION WAS HELD REGARDING
LIST SPONSERED PROGRAM TAPES.
ONE SUGGESTION WAS TO HAVE
PROGRAMS AVAILABLE ON FLOPPY
DISCS IN OLINGER, AND LARKEN
FORMATS.

FRED STERN REPORTED THAT HE HAS
ANSWERED MANY INQUIRIES ABOUT
PROGRAM TAPES, BUT NO ONE HAS
YET SENT A CHECK TO PLACE AN
ORDER.

LATE FLASH, LATE FLASH

AS I AM WRITING, STONEY
TELEPHONES TO REPORT SMUG IS
HAVING A SINCLAIR CONVENTION AT
HOLIDAY INN, WAUKESHA, WIS.
THE CONVENTION WILL START WITH
A BANQUET ON JUNE 1, 1990 AND
EXTEND THROUGH JUNE 3, 1990.
FOR MORE INFORMATION CONTACT;
BILL HEBERLEIN
5052 NORTH 91 ST.
MILWAUKEE, WIS. 53225
OR YOU CAN TELEPHONE;
NEIL SHULTZ
414-353-4522
7:00 -10:00 CST

HARVEY READ LETTERS WHICH WERE
RECEIVED SINCE THE LAST
MEETING. FRED STERN WILL ANSWER
THESE CORRESPONDENCE.

CLASSIFIEDS

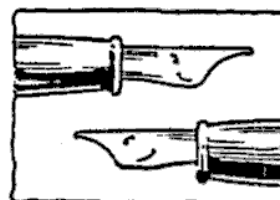
THIS CLASSIFIED SECTION IS
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LISTED IN THIS CLASSIFIED
SECTION

I AM INTERESTED IN A DISC.
DRIVE CONTROLLER FOR THE TS1000.
CONTACT FRED STERN AT THE
LISTING ADDRESS ABOVE.

A FINAL WORD

MY NAME IS FRED STERN AND I AM
THE EDITOR OF THIS EDITION OF
LISTING.

THANK YOU GO TO TOM S. AND
STONEY M.
SEE YOU ALL AT THE NEXT MEETING.



LIST TAPE LISTINGS



The following is a listing of the programs on LIST tape #9. These are all 2068 programs. To get this tape or any of the other LIST tapes, send \$6.00, OR a QUALITY 60 minute tape and \$3.00 to Harvey Rait, at the address in the box on the first page. Better yet, come to the meetings and pay only \$1.50 per tape (call or write Harvey first so he can have the tape(s) ready).



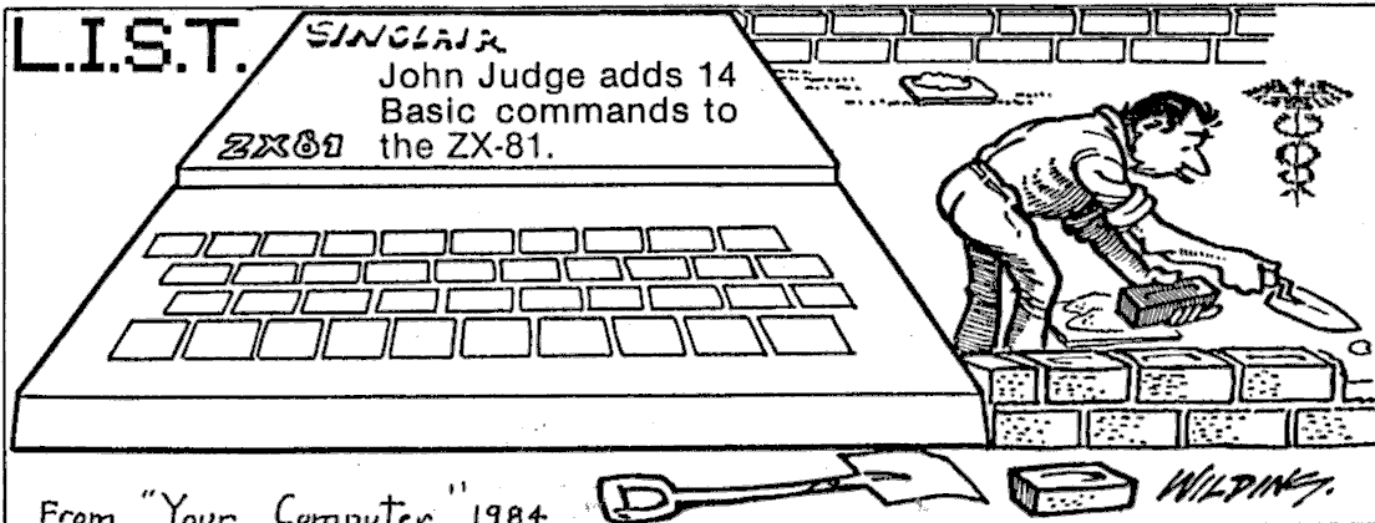
- 1 Wrapping
- 2 PROCODE
- 3 WORD PROCS
- 4 AERCO INT
- 5 TALK CLOCK
- 6 ZTALK
- 7 INVOICING
- 8 BIURYTMS
- 9 READER 1
- 10 READER 2
- 11 TRACE
- 12 RENUMBER
- 13 CASE SWAP
- 14 VARS
- 15 SCROLL
- 16 SCROLL
- 17 SCROLL
- 18 OVERS 1
- 19 OVERS 2
- 20 PATTERNS 1
- 21 PATTERNS 2
- 22 PAINTING
- 23 PICTURE
- 24 FLAG
- 25 FILE
- 26 ANDROIDS
- 27 B & C
- 28 SIMON SAYS
- 29 FINAL
- 30 TEST
- 31 SECONDS
- 32 NAVIGATION
- 33 SQ ROOT
- 34 UP & DOWN
- 35 DIG. TIMER
- 36 PAPER & INK
- 37 BEWARE DOG
- 38 EXAM
- 39 KEYBOARD M
- 40 LAS VEGAS
- 41 PARROT
- 42 KENTACKY
- 43 STM
- 44 MC EXAMPLE
- 45 SHAKESPEARE

- 46 TRESURE H
- 47 I.T. ONE
- 48 THE I.T.
- 49 WOLF & GOATS
- 50 RACER
- 51 AT MARKET
- 52 WINDOWS
- 53 STICKS
- 54 NEW CHR\$
- 55 NEW CHR\$
- 56 NEW CHR\$
- 57 NEW CHR\$
- 58 MESSAGE
- 59 TITLEMAKER
- 60 REGRESSION
- 61 BAR GRAPH
- 62 SCROLL\$
- 63 AUTUMN
- 64 NO. SORT
- 65 WORD SORT
- 66 DERBY DAY
- 67 ATTR TABLE
- 68 METRIC
- 69 HEADER
- 70 HEADER/C
- 71 SEARCH
- 72 S/DATA
- 73 DEMOLITION



- SIDE B
- 1 DEMOLITION
- 2 DEMOLITION
- 3 SUBMARINE
- 4 BRICKS
- 5 MUNEYPAIL
- 6 CHOMPER
- 7 ASTEROIDS
- 8 TREE MAKER
- 9 MOZART WA
- 10 SANTA WA86
- 11 LOANS WA86
- 12 E 2 DIS
- 13 UDG DESIGN
- 14 NETWORK
- 15 128 COLORS
- 16 BANANAS
- 17 M/C LOADER
- 18 PSGE 32/64
- 19 MMI
- 20 CHARACTERS
- 21 FULLGIRLS
- 22 JANIS
- 23 CONVERSION
- 24 TIMER 1C
- 25 TITLE/CODE
- 26 BES
- 27 ATTR
- 28 2XSIZEHTE
- 29 3 CHARS
- 30 TITL/SHOOT
- 31 TITL/SHOOT
- 32 PAINTSIC
- 33 SANTA
- 34 SCRAMBLER
- 35 TAPE/ANALY
- 36 MULTIFILE
- 37 SAVER
- 38 SAVER MC
- 39 TASPRINT
- 40 TASFONT 0
- 41 TASPRINT
- 42 TAS2PRINT
- 43 TAS2PRINT
- 44 TASPRINT
- 45 COMMENTS

BETTA BASIC



THIS SET OF machine-code routines provides the 16K ZX-81 with 14 new Basic statements and commands usually found only on much larger and more expensive machines. The routines take up 1336 bytes in a Rem statement and are designed for ease of use with full error codes. Two of the routines are interrupt driven and allow you to add your own interrupt driven routines.

To enter the program, a 16K ZX-81 with the New run has to be used, it may be possible to use less memory, but some of the routines will crash if the display file is collapsed, i.e., RAM is less than 3/4K.

First, line 1 Rem followed by 128 zeros — four lines — is entered. This is then duplicated as line 2 and so on up to line 10. When this has been done, the following are entered as direct commands.

```
POKE 16511,56
POKE 16512,5
POKE 16509,0
POKE 16510,0
POKE 16514,118
POKE 16515,118
1 REM BETTA BASIC
POKE 16419,1
NEW LINE
```

You should now have
1 REM BETTA BASIC

on the screen. Anything else means that you have probably done something wrong and it is

best to start again.

If all is well then enter the hex-loader program 1, ignoring line 0 as this should already be in memory. Type Run N/L then enter the start address for the machine code data, which will be 16514 if you are just starting or another number if you are continuing from another day or after saving partly completed data. You can now enter the hexadecimal data, as many of the numbers as you like before pressing Newline, but remembering not to enter any of the spaces. There is a check-sum number after each line of data which you can compare with the check-sum number on the screen, if it is different then press S N/L and you can enter the line that is wrong. By pressing Q N/L, you can break out of the program to save it.

Looking through data

Program 2 is for looking through the data for any that is wrong. To use it, type Run 200 then enter the start address. Type Cont after each screenfull.

If all the data is entered and correct, then delete lines 5 onwards and enter program 3. Do not use New to delete the lines. The program is now finished and ready to use, unless some bugs have escaped detection.

You must have Betta Basic present in the computer before you start typing in your

program. In this way the machine code routines are saved as you save your program that uses them. Now, whenever you type Run, the variables are initialised ready for use.

INT: Switches on the interrupt routine by Rand USR Int to give the following features:

TRACE ON by POKE TRN, 1 or pressing N/L and 1 together;

MEMORY ON by POKE TRN, 2 or pressing N/L and 5;

MEM/TRACE OFF by POKE TRN, 0 or pressing N/L and 2;

ROUTINE OFF by pressing N/L and 3 or Fast then Slow;

Break out of any program — even machine code — by pressing N/L and 4. This also switches routine off;

TRACE SPEED by POKE LEN, n where n is the length of the pause at each interrupt. Initially 3;

USER ROUTINE: Three bytes — USE, USE + 1 and USE + 2 — are set aside to add to call to your own interrupt driven routine. Initially all are NOPS. Make sure the routine is Off by using Fast followed by Slow before you start Poking or a crash will occur as soon as you Poke in the first number.

When using the trace or memory left
(continued on next page)

Program 1.

```
1 REM 000000 ETC....
5 SCROLL
6 SCROLL
10 PRINT AT 18,0;"START ADDRESS
3?"
15 LET A$=""
20 INPUT S
30 FOR X=S TO 17795 STEP 7
40 SCROLL
50 PRINT AT 19,0;X;
55 LET C=0
60 FOR T=X TO X+6
70 IF A$="" THEN INPUT A$
```

```
80 IF A$="S" THEN RUN
84 IF A$="Q" THEN STOP
86 IF LEN A$/2<>INT (LEN A$/2)
THEN LET A$=""
88 IF A$="" THEN GOTO 70
90 LET N=16*CODE A$+CODE A$(2)
-476
100 POKE T,N
110 LET C=C+N
120 PRINT " ";A$( TO 2);
125 LET A$=A$(3 TO )
130 NEXT T
140 PRINT " ";C
150 NEXT X
```

Features, the number will take up the first five characters in the top left corner of the screen. These numbers are only printed up during the interrupt and the original text or graphics are put back into the screen before control is handed back to the ROM. So as far as the ROM is concerned, the numbers do not even exist on the screen and so will not be "in the way". But it is important not to use the Sinclair scroll command as this will cause a crash after 23 scrolls.

Pressing N/L and 4 will break out of any machine code programs as long as the routine is switched on by Rand USR Int.

The Trace and Memory Left routines will automatically switch off when program execution ends or any error occurs, though they can operate in command mode by using N/L and the function keys 1 to 5.

The interrupt routine will be switched off by any of the following: Fast, Copy, LPrint, LList, Save, Load, Pause, New or by entering a line. If any of these are used then do not forget to switch on again by using Rand USR Int before using Trace or Memory Left.

LOC: This moves VARS up to Eline so that all the variables temporarily disappear and

ERROR CODES.

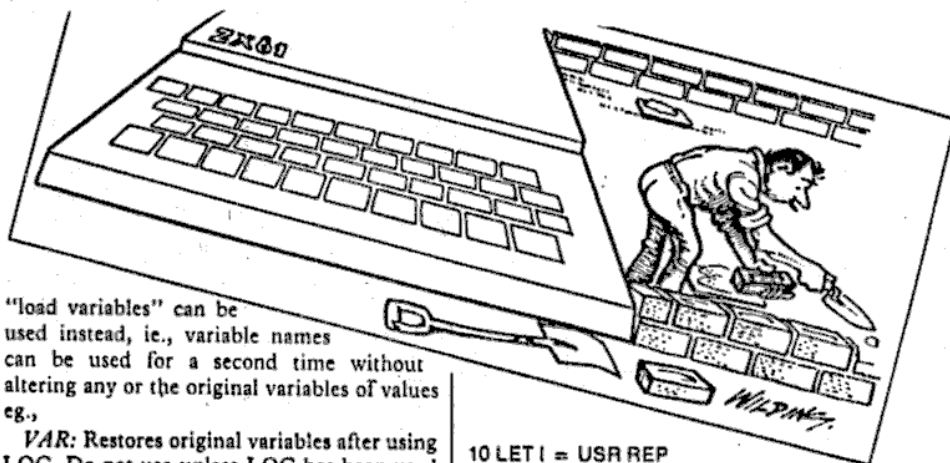
- Z variable not found, eg., R\$ in Rep, Proc name etc
- 4 out of memory
- B integer out of range, ie a number less than 0 or greater than 65535 has been used in a routine
- C number error, ie a number or expression has been left out or does not make sense so the computer can not change it to an integer for it to use.
- D break
- Q missing ;
- R too many repeats (max 17)
- S syntax error, eg no data or expressions
- T missing
- U until without repeat
- V R\$ error, eg., R\$ has been DIMed or is too short so that Rep and Unt can not use it.
- W Rand too high for LST
- X Proc name error, eg too short (minimum three characters or non-existent)
- Y Incorrect string variable in line after DYN

Program 2.

```

190 STOP
200 PRINT "START ADDRESS ?"
210 INPUT I
220 FOR X=I TO 17795 STEP 7
230 PRINT X;
240 LET C=0
250 FOR T=X TO X+6
260 LET N=PEEK T
270 LET C=C+N
280 PRINT " ";CHR$(INT (N/16) +
28) ;CHR$(N-16*INT (N/16)+28);
290 NEXT T
300 PRINT " , ";C
310 NEXT X

```



"load variables" can be used instead, ie., variable names can be used for a second time without altering any or the original variables of values eg.,

VAR: Restores original variables after using LOC. Do not use unless LOC has been used first. For example:

RAND USR VAR.

SCL: Stands for Scroll. Do not use the scroll provided by Sinclair as it will cause some of the routines to crash. For example:

RAND USR SCL.

In the following, X and Y can be any numerical argument in the range 0 to 65535, V any numerical variable, I any numerical dummy variable that is not used for anything else, anything surrounded by [] is optional, all Print statements will be changed to Rem by the routine, and should be changed back to Print if ever the line is edited. The Print lines after the USR lines hold the arguments for each routine.

Function has three uses

PRT: This has three uses, two of which are concerned with the ports.

a) OUT (port), byte. For example:

```

10 LET I = USR PRT
20 PRINT X, Y I; X, Y . . . I

```

b) IN variable, (port) or LET variable = IN (port). For example:

```

10 LET I = USR PRT
20 PRINT; X where X = port 0 to 255

```

c) LD I, X. For example:

```

10 LET I = USR PRT
20 PRINT; X where X = char set 0 to 255

```

This one changes the character set and can be used for games or with a graphics ROM — initially 30.

REP: Same as BBC Basic Repeat. The line numbers are stored in R\$. Up to 15 Repeats can be nested — inside each other — before an error occurs. For example:

```

10 LET I = USR REP

```

UNT: BBC Basic Until. Jumps back to line after last Rep. If a testable condition is not true. For example.

```

10 LET I = USR UNT
20 PRINT testable condition

```

ONG: Same as On . . . Go To . . . Jumps to the Xth line number in a list of numbers. If X = 0 or X > number of numbers in list then the line after the ONG is executed. For example:

```

10 LET I = USR ONG
20 PRINT X; line [, line . . . ]

```

Up to 255 lines can be put on the list.

PRC: Def Proc. This is a simulation of procedures, using names instead of line numbers. Each 'procedure' has the following structure:

```

10 REM PROCNAME
20 Subroutine or procedure
30 RETURN

```

where Name will be the name of the procedure. PRC is called only once at the beginning of the program. For example:

```

10 LET I = USR PRC

```

The routine then searches for all the "Rem Procname"s and puts the names into the variables area with their line numbers so that a procedure can be called by:

```

GOSUB NAME

```

The name must be three or more characters long and contain only characters legal as a variable name, see page 38 of the Sinclair manual. There is no space between the Proc and the Name.

DYN: Dynamic procedure. This routine tells you whether a name held a string variable is a procedure or not so that it may be used with VAL without an error occurring. If it does not exist, eg.,

```

10 INPUT AS
20 IF USR DYN THEN GOTO VAL AS
30 REM AS
40 GOTO 10

```

The above example Gotos a procedure entered in line 10 if it exists, otherwise it waits for you to enter another. The AS in lines 10, 20 and 30 can be changed to any other string variable.

LST This is a fast scrolling list with a few extra features. To use:

Rand line to list from Rand USR LST

In this routine you can press:

Space to break out of the routine;

Z to copy the screen to the printer;

K to "normal list" the last line on the screen in order to edit;

D to list through slowly;

USEFUL ROM ROUTINES USED:

```
08F5h PRINT AT B,C;
```

```
0908h PRINT CHR$(A); Chars 0-63 and
      their inverses
0948h PRINT CHR$(A); Chars 64-127 and
      192-255
```

```
0A98h PRINT BC;
```

DAZAH CLS

063EN LIST

Same a pressing
Newline

0269h COPY

1620n STK BC

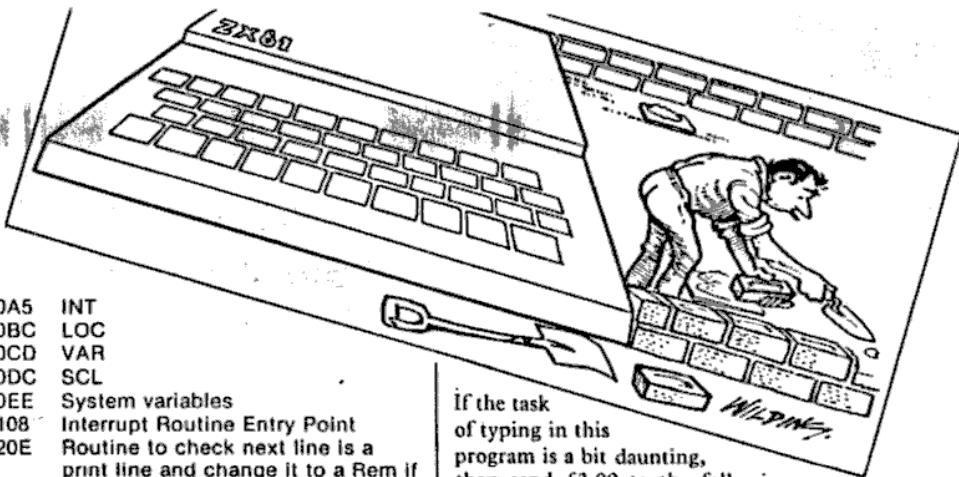
Puts BC on calc stack as "floating point" number
Takes BC off calc. stack
Finds variable pointed to by CH-ADD and puts its address into HL

7h UNSTK BC

Ch LOOKVARS

40A5	INT		
40BC	LOC		
40CD	VAR		
40DC	SCL		
40EE	System variables		
4108	Interrupt Routine Entry Point		
420E	Routine to check next line is a print line and change it to a Rem if necessary.		
4227	PRT	436Z	DYN
4270	REP	43EE	PRC
42BA	UNT	44A6	LST
430D	ONG	45B5	last address

If the task of typing in this program is a bit daunting, then send £3.00 to the following address and I will send you a copy of the finished program on tape: J D Judge, 147 Hesters Way Road, Cheltenham, Gloucestershire. GL51 0SD.



Hex dump and checksums

```

0 REM
3 REM 6-15-83
      (C) J. JUDGE 1983
10 LET R$=" "
11 LET INT=16516
12 LET LOC=16519
13 LET VAR=16522
14 LET SCL=16525
15 LET PRT=16528
17 LET REP=16531
18 LET UNT=16534
19 LET ONG=16537
20 LET DYN=16540
21 LET PRC=16543
22 LET LST=16546
23 LET LEN=16532
24 LET TRN=16633
25 LET USE=16678

```

Program 3.

[The page contains dense, illegible vertical text columns.]



From Sinclair Programs 1983

```

1 REM "PLANETS"
2 GOTO 1000
3 PRINT AT 20,20;"9TH PLANET"
4 PRINT AT 10,10;"<-----"
   SUN"
5 PRINT AT 0,23;"PLUTO"
7 PRINT AT 2,23;"DISTANCE"
8 PRINT AT 3,23;"3670 MILL"
9 PRINT AT 4,23;"ORBIT"
10 PRINT AT 5,23;"248.4YRS"
11 FOR T=0 TO 30
12 LET A=T/15*PI
13 LET SX=21+21*SIN A
14 LET SY=22+21*COS A
15 PLOT SX,SY
16 NEXT T
17 PAUSE 250
18 CLS
19 GOTO 2000
20 STOP
21 PRINT AT 10,10;"<-----"
   SUN"
22 PRINT AT 1,23;"PLUTO"
24 PRINT AT 3,23;"DISTANCE"
25 PRINT AT 4,23;"2794 MILL"
26 PRINT AT 5,23;"ORBIT"
27 PRINT AT 6,23;"164.8YRS"
28 PRINT AT 20,20;"8TH PLANET"
40 FOR T=0 TO 30
50 LET A=T/15*PI
60 LET SX=21+18*SIN A
70 LET SY=22+18*COS A
75 PLOT SX,SY
76 NEXT T
77 PAUSE 250
78 CLS
79 GOTO 2500
80 PRINT AT 10,10;"<-----"
   SUN"
81 PRINT AT 0,23;"URANUS"
83 PRINT AT 2,23;"DISTANCE"
84 PRINT AT 3,23;"1783 MILL"
85 PRINT AT 4,23;"ORBIT"
86 PRINT AT 5,23;"84.02 YRS"
87 PRINT AT 20,20;"7TH PLANET"
98 FOR T=0 TO 30
99 LET A=T/15*PI
100 LET SX=21+15*SIN A
110 LET SY=22+15*COS A
120 PLOT SX,SY
125 NEXT T
130 PAUSE 250
140 CLS
150 GOTO 3000
379 PRINT AT 20,20;"3RD PLANET"

```

```

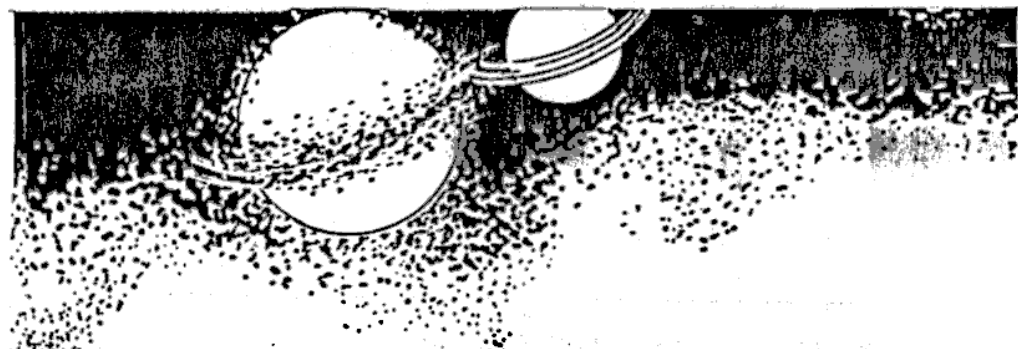
380 PRINT AT 10,10;"<-----"
   SUN"
381 PRINT AT 0,23;"EARTH"
383 PRINT AT 2,23;"DISTANCE"
389 PRINT AT 3,23;"93 MILL"
390 PRINT AT 4,23;"ORBIT"
391 PRINT AT 5,23;"1 YEAR"
392 FOR T=0 TO 30
393 LET A=T/15*PI
394 LET SX=21+7*SIN A
395 LET SY=22+7*COS A
395 LET SY=22+7*COS A
396 PLOT SX,SY
397 NEXT T
398 PAUSE 250
399 CLS
400 GOTO 5500
500 PRINT AT 10,10;"<-----"
   SUN"
510 PRINT AT 0,23;"SATURN"
530 PRINT AT 2,23;"DISTANCE"
540 PRINT AT 3,23;"866 MILL"
550 PRINT AT 4,23;"ORBIT"
560 PRINT AT 5,23;"29.46 YRS"
565 PRINT AT 20,20;"6TH PLANET"
600 FOR T=0 TO 30
610 LET A=T/15*PI
620 LET SX=21+13*SIN A
630 LET SY=22+13*COS A
640 PLOT SX,SY
641 NEXT T
642 PAUSE 250
643 CLS
644 GOTO 3500
650 PRINT AT 10,10;"<-----"
   SUN"
651 PRINT AT 0,23;"JUPITER"
653 PRINT AT 2,23;"DISTANCE"
654 PRINT AT 3,23;"483 MILL"
655 PRINT AT 4,23;"ORBIT"
656 PRINT AT 5,23;"11.86 YRS"
657 PRINT AT 20,20;"5TH PLANET"
700 FOR T=0 TO 30
710 LET A=T/15*PI
720 LET SX=21+10*SIN A
730 LET SY=22+10*COS A
735 PLOT SX,SY
740 NEXT T
745 PAUSE 250
746 CLS
747 GOTO 4000
750 PRINT AT 10,10;"<-----"
   SUN"
751 PRINT AT 0,23;"MARS"
753 PRINT AT 2,23;"DISTANCE"
754 PRINT AT 3,23;"141 MILL"

```

```

755 PRINT AT 4,23;"ORBIT"
756 PRINT AT 5,23;"1.88 YRS"
757 PRINT AT 20,20;"4TH PLANET"
760 FOR T=0 TO 60
770 LET A=T/30*PI
780 LET SX=21+8*SIN A
790 LET SY=22+8*COS A
800 PLOT SX,SY
810 NEXT T
815 PAUSE 250
820 CLS
830 GOTO 5000
849 PRINT AT 20,20;"2ND PLANET"
850 PRINT AT 10,10;"<-----"
   SUN"
851 PRINT AT 0,23;"VENUS"
853 PRINT AT 2,23;"DISTANCE"
854 PRINT AT 3,23;"67.2 MILL"
855 PRINT AT 4,23;"ORBIT"
856 PRINT AT 5,23;"225 DAYS"
857 FOR T=0 TO 30
858 LET A=T/15*PI
859 LET SX=21+4*SIN A
860 LET SY=22+4*COS A
861 PLOT SX,SY
862 NEXT T
863 PAUSE 250
864 CLS
865 GOTO 7000
900 PRINT AT 10,10;"<-----"
   SUN"
905 PRINT AT 0,23;"MERCURY"
907 PRINT AT 2,23;"DISTANCE"
908 PRINT AT 3,23;"36 MILL"
909 PRINT AT 4,23;"ORBIT"
910 PRINT AT 5,23;"88 DAYS"
915 PRINT AT 20,20;"1ST PLANET"
920 FOR T=0 TO 30
925 LET A=T/15*PI
930 LET SX=21+2*SIN A
940 LET SY=22+2*COS A
950 PLOT SX,SY
955 NEXT T
960 PAUSE 250
970 CLS
980 GOTO 8000
999 STOP
1000 PRINT "THE PLANETARY SYSTEM"
"
1020 PRINT
1030 PRINT "THIS COMPUTER PROGRA"
MME GIVES"
1040 PRINT "DETAILS OF THE SOLAR"
SYSTEM"
1050 PRINT "AND INCLUDES AN ANIM"
ATED"

```



Planet invaders game. It is an educational routine which provides the user with a semi-educational description of each planet, followed by an animated graphic presentation of each planetary orbit. We are sure that it will prove useful to science students and teachers. It was sent by K F Williams of New South Wales, Australia (16K ZX-81).

PLANETS

```

1060 PRINT "REPRESENTATION OF TH
E PLANETARY"
1070 PRINT "ORBITS OF OUR SOLAR
SYSTEM."
1075 PRINT
1100 PRINT "PRESS ""NEWLINE KEY""
"" TO START""
1110 PRINT "YOUR JOURNEY THROUGH
TIME AND"
1120 PRINT "S P A C E."
1121 PRINT
1122 PRINT
1123 PRINT """"PLUTO"" ""NEPTUNE""
""URANUS""
1125 PRINT
1126 PRINT """"SATURN"" ""JUPITER
""MARS""
1128 PRINT
1129 PRINT """"EARTH"" ""VENUS""
""MERCURY""
1132 INPUT A#
1135 CLS
1140 IF A#="" THEN GOTO 1200
1200 PRINT "PLUTO"
1220 PRINT "THE NINTH PLANET OF
THE SOLAR"
1230 PRINT "SYSTEM,ORBITING THE
SUN AT A"
1240 PRINT "MEAN DISTANCE OF 39.
53AU IN"
1250 PRINT "248.4 YEARS,PLUTO WA
S DISCOVERED"
1260 PRINT "IN 1930 FOLLOWING OB
SERVATIONS"
1270 PRINT "OF PERTURBATIONS IN
NEPTUNES"
1280 PRINT "ORBIT,PLUTOS MASS IS
PROBABLY"
1290 PRINT "LESS THAN 0.1 OF THA
T OF EARTH."
1295 PRINT "DIAMETER IS PROBABLY
5000 TO"
1296 PRINT "6000 KILOMETRES AND
THE ORBIT IS"
1297 PRINT "VERY ECCENTRIC"
1298 PRINT
1299 PRINT
1300 PRINT "PRESS ""NEWLINE TO S
EE ORBIT"
1302 INPUT A#
1303 CLS
1304 IF A#="" THEN GOTO 3
2000 PRINT "NEPTUNE"
2011 PRINT
2012 PRINT
2013 PRINT "THE FOURTH LARGEST P
LANET AND"
2014 PRINT "THE EIGHTH PLANET FR
OM THE SUN."
2015 PRINT "NEPTUNE WAS FIRST DI
SCOVERED IN"
2016 PRINT "1846 BASED ON PERTUR
BATIONS IN"
2017 PRINT "THE ORBIT OF URANUS.
NEPTUNE HAS TWO MOONS, ""TRITON""
AND ""HEREID""
2018 PRINT "NEPTUNES ""YEAR"" IS
164.8 TIMES"
2019 PRINT "THAT OF EARTH,ITS DI
AMETER IS"
2020 PRINT "ABOUT 51 M/M AND ITS
MASS ABOUT"
2021 PRINT "17.45 TIMES THAT OF
THE EARTH"
2022 PRINT
2023 PRINT
2024 PRINT "PRESS ""NEWLINE"" TO
SEE ORBIT"
2025 INPUT A#
2026 CLS
2027 IF A#="" THEN GOTO 21
2500 PRINT "URANUS"
2515 PRINT
2520 PRINT "THE THIRD LARGEST PL
ANET IN THE"
2530 PRINT "SOLAR SYSTEM AND SEV
ENTH FROM"
2540 PRINT "THE SUN,PHYSICALLY V
ERY SIMILAR"
2550 PRINT "TO NEPTUNE,BUT RATHE
R LARGER"
2560 PRINT "53 M/M +/- 5 0/0,ITS
DISTANCE"
2570 PRINT "FROM THE SUN IS 19.2
AU AND IT"
2580 PRINT "ORBITS THE SUN IN 84
.02 YEARS."
2590 PRINT "URANUS HAS FIVE MOON
S IN ORBITS"
2591 PRINT "THAT ARE RETROGRADE."
2592 PRINT
2593 PRINT
2594 PRINT "PRESS ""NEWLINE"" TO
SEE ORBIT"
2595 INPUT A#
2596 CLS
2597 IF A#="" THEN GOTO 60
3000 PRINT "SATURN"
3015 PRINT
3020 PRINT
3025 PRINT "THE SECOND LARGETS P
LANET IN THE"
3030 PRINT "SOLAR SYSTEM AND THE
SIXTH FROM"
3035 PRINT "FROM THE SUN,IT ORBI
TS THE SUN"
3040 PRINT "IN 29.46 YEARS AT A
DISTANCE OF"
3045 PRINT "9.54AU,SATURN HAS TH
E LOWEST"
3050 PRINT "DENSITY OF ALL OF TH
E PLANETS."
3055 PRINT "LESS THAN THAT OF WA
TER,AND MAY"
3060 PRINT "CONTAIN OVER 60 0/0
HYDROGEN BY"
3065 PRINT "MASS,ITS TOTAL MASS
IS 95 TIMES"
3070 PRINT "THAT OF EARTH,SATURN
HAS TEN"
3075 PRINT "MOONS AND ITS MOST S
TRIKING"
3080 PRINT "FEATURE ARE THE SYST
EM OF RINGS"
3090 PRINT "16 KM THICK AND THOU
GHT TO BE"
3095 PRINT "COMPOSED OF TINY ICE
PARTICLES"
3100 PRINT
3110 PRINT
3125 PRINT "PRESS ""NEWLINE"" TO
SEE ORBIT"
3130 INPUT A#
3135 CLS
3140 IF A#="" THEN GOTO 500
3500 PRINT "JUPITER"
3520 PRINT
3530 PRINT
3535 PRINT "JUPITER IS THE LARGE
ST AND MOST"
3540 PRINT "MASSIVE IN THE SOLAR
SYSTEM AND"
3545 PRINT "IS FIFTH FROM THE SU
N, MASS IS"
3550 PRINT "317.8 TIMES THAT OF
THE EARTH."
3555 PRINT "JUPITER IS 5.20AU FR
OM THE SUN"
3560 PRINT "AND HAS AN ORBIT OF
11.86 EARTH"
3565 PRINT "YEARS,ATMOSPHERE CON
SISTS MAINLY"
3570 PRINT "OF METHANE,AMMONIA A
ND HYDROGEN"

```


3575 PRINT ".JUPITER HAS 13 MOON
 S. THE TWO"
 3580 PRINT "LARGEST BEING ""GANE
 YMEDE"" AND"
 3585 PRINT ""CALLISTO. JUPITER H
 AS A VERY"
 3590 PRINT "PROMINENT FEATURE CA
 LLED ""THE"
 3595 PRINT "RED SPOT"" THAT HAS
 BEEN STUDIED"
 3600 PRINT "FOR OVER 150 YEARS"
 3610 PRINT
 3620 PRINT
 3630 PRINT "PRESS ""NEWLINE"" TO
 SEE ORBIT"
 3635 INPUT A\$
 3640 CLS
 3650 IF A\$="" THEN GOTO 650
 4500 PRINT "MARS"
 4520 PRINT
 4530 PRINT
 4535 PRINT "MARS IS THE FOURTH P
 LANET FROM"
 4540 PRINT "THE SUN. WITH AN ORBI
 T OF 687"
 4545 PRINT "EARTH DAYS. AND IS 1.
 52AU FROM"
 4550 PRINT "THE SUN. THE HIGHEST
 TEMPERATURE"
 4555 PRINT "AT THE EQUATOR IS AB
 OUT 30 DEG."
 4560 PRINT "AND THE LOWEST ABOUT
 -100 DEG."
 4565 PRINT "CENTIGRADE. MARS HAS
 A MEAN DIAM."
 4570 PRINT "OF 6750 KM. AND HAS D
 ISTINCTIVE"
 4575 PRINT "POLAR ICE CAPS WITH
 SEASONAL"
 4580 PRINT "RECESSION. MARS HAS T
 WO MOONS"
 4585 PRINT """"PHOBOS"" AND ""DEI
 MOS"" AND"
 4590 PRINT "IT IS UNSURE IF MARS
 CAN SUPPORT"
 4591 PRINT "LIFE AS KNOWN ON PLA
 NET EARTH."
 4592 PRINT
 4593 PRINT
 4594 PRINT "PRESS ""NEWLINE"" TO
 SEE ORBIT"
 4595 INPUT A\$
 4596 CLS
 4597 IF A\$="" THEN GOTO 750
 5000 PRINT "EARTH"
 5020 PRINT
 5030 PRINT
 5040 PRINT "PLANET EARTH IS THE
 THIRD PLANET"
 5050 PRINT "FROM THE SUN. AND AT
 THIS TIME"
 5060 PRINT "THE ONLY PLANET KNOW
 N TO SUPPORT"
 5070 PRINT "LIFE AS WE KNOW IT. T
 HE EARTH IS"
 5080 PRINT "RATHER LARGER THAN V
 ENUS. AND HAS"
 5090 PRINT "AN ORBIT OF APPROX. 0
 NE YEAR ON"
 5100 PRINT "ITS JOURNEY AROUND T
 HE SUN. EARTH"
 5120 PRINT "IS SLIGHTLY FLATTENE
 D AT THE"
 5130 PRINT "POLES AND IS ABOUT 1

2756 KM IN"
 5140 PRINT "DIAMETER. AS WE ALL K
 NOW. EARTH"
 5150 PRINT "HAS ONE MOON. THE EAR
 TH WAS"
 5160 PRINT "FORMED ABOUT 4550 MI
 LION YEARS"
 5170 PRINT "AGO AND HAS SUPPORTE
 D MAN FOR"
 5180 PRINT ".009 0/0 OF THIS TIM
 E"
 5190 PRINT
 5195 PRINT "PRESS ""NEWLINE"" TO
 SEE ORBIT"
 5200 INPUT A\$
 5210 CLS
 5220 IF A\$="" THEN GOTO 379
 5300 PRINT "VENUS"
 5320 PRINT
 5330 PRINT
 5340 PRINT "VENUS IS THE SECOND
 PLANET FROM"
 5350 PRINT "THE SUN AND IS ABOUT
 THE SAME"
 5360 PRINT "SIZE AS THE EARTH. AN
 D IS .72AU"
 5370 PRINT "DISTANT FROM THE SUN
 , AND ORBITS"
 5380 PRINT "THE SUN IN 225 DAYS.
 ABOUT TWO"
 5390 PRINT "THIRDS OF AN EARTH Y
 EAR."
 5600 PRINT "THE SURFACE TEMPERAT
 URE IS ABOUT"
 5610 PRINT "750 DEGRESS K. THE SU
 RFACE IS"
 5620 PRINT "COMPLETELY OBSCURED
 BY DENSE"
 5630 PRINT "CLOUDS CONTANING SUL
 PHURIC ACID"
 5640 PRINT "LIFE AS WE KNOW IT C
 OULD NOT"
 5650 PRINT "EXIST UNDER THESE CO
 NDITIONS"
 5660 PRINT
 5670 PRINT
 5680 PRINT "PRESS ""NEWLINE"" TO
 SEE ORBIT"
 5690 INPUT A\$
 5691 CLS
 5695 GOTO 849
 6000 PRINT "STANDBY"
 7000 PRINT "MERCURY"
 7020 PRINT
 7030 PRINT
 7040 PRINT "MERCURY IS THE PLANE
 T CLOSEST TO"
 7050 PRINT "THE SUN. NIGHT SURFAC
 E TEMP IS"
 7060 PRINT "THOUGHT TO BE 110 DE
 GRESS K. AND"
 7070 PRINT "AND MIDDAY EQUATORIA
 L TEMP ABOUT"
 7080 PRINT "600 DEGREES K. THUS P
 RECLUDING"
 7090 PRINT "LIFE AS WE KNOW IT O
 N EARTH"
 7100 PRINT "MERCURY HAS LITTLE O
 R NO KNOWN"
 7120 PRINT "ATMOSPHERE. AND HAS N
 O MOONS"
 7130 PRINT "THE PLANETS AVERAGE
 DENSITY IS"
 7140 PRINT "5.2 GRAMS PER CUBIC

CENTINETRE"
 7150 PRINT
 7160 PRINT
 7170 PRINT "PRESS ""NEWLINE"" TO
 SEE ORBIT"
 7180 INPUT A\$
 7190 CLS
 7195 IF A\$="" THEN GOTO 900
 8000 PRINT ""ZX-81 MICRO-COMPUT
 ER""
 8020 PRINT
 8030 PRINT "TRUSTS YOU HAVE ENJO
 YED THIS"
 8035 PRINT
 8040 PRINT "LITTLE TRIP THROUGH
 THE SOLAR"
 8045 PRINT
 8050 PRINT "SYSTEM AND THAT IT H
 AS GIVEN YOU"
 8055 PRINT
 8060 PRINT "FOOD FOR THOUGHT AND
 A BETTER"
 8065 PRINT
 8070 PRINT "UNDERSTANDING OF OUR
 UNIVERSE"
 8080 PRINT
 8090 PRINT
 8091 PRINT
 8092 PRINT "*** ** ** ** ** **
 ** ** ** **
 8093 PAUSE 800
 8094 CLS
 8095 PRINT "AS A SOBERING THOUGH
 T HERE ARE"
 8100 PRINT "THE DISTANCES FROM T
 HE SUN IN"
 8200 PRINT "MILES OF EACH OF OUR
 9 PLANETS"
 8300 PRINT
 8400 PRINT "PLUTO.....3670 MILLI
 ON MILES"
 8500 PRINT "NEPTUNE...2794 MILLI
 ON MILES"
 8510 PRINT "URANUS....1783 MILLI
 ON MILES"
 8520 PRINT "SATURN....866.2 MILL
 ION MILES"
 8530 PRINT "JUPITER...483.3 MILL
 ION MILES"
 8540 PRINT "MARS.....141.5 MILL
 ION MILES"
 8550 PRINT "EARTH.....93 MILLION
 MILES"
 8560 PRINT "VENUS.....67.2 MILLI
 ON MILES"
 8570 PRINT "MERCURY...36 MILION
 MILES"
 8580 PRINT
 8590 PRINT "IT TAKES SUNLIGHT 8.
 33 MINUTES"
 8595 PRINT "TO REACH EARTH AT 18
 6000 MILES"
 8600 PRINT "PER SECOND....."
 8610 PRINT "IT WOULD TAKE A ""JU
 MBO"" JET 645"
 8620 PRINT "DAYS AT 600 MPH NON-
 STOP....."
 8630 PRINT
 8640 PRINT ".....THINK ABOUT
 IT"
 9000 STOP
 9001 SAVE "PLANETS"
 9002 GOTO 1



HEX BIN CONVERTER is a program for conversions between the hexadecimal, decimal and binary number systems. Conversions can be made for numbers between the equivalents of 0 and 65535 decimal from hex or decimal into the other two systems or from binary into hex.

When RUN, the program will ask the user for his choice of number system input; enter "\$" for decimal, "*" for hex or "B" for binary. Then enter the number and its conversions will be printed on the screen. Another number in the same system may then be entered, or a switch to another system be effected by entering the appropriate symbol. The display scrolls after every conversion.

This excellent routine was sent by Dr B. Thornton of Salisbury, Wiltshire. (16K ZX-81).

Hex Bin Converter

```
20 PRINT AT 1,3;"DECIMAL-HEXAD  
ECIMAL-BINARY";AT 3,8;"INTERCONV  
ERSION"
```

```
30 PRINT AT 6,9;"SELECT INPUT"  
40 PRINT AT 9,6;"(*)= DECIMAL"  
AT 11,6;"(X)= HEXADECIMAL";AT  
13,6;"(B)= BINARY"
```

```
50 REM initialise  
60 DIM Y$(16)  
70 LET Z$="0000000000000000"  
80 LET Q$=""
```

```
90 LET C$="1248"
```

```
100 LET C=19
```

```
110 DIM B(4)
```

```
120 LET B(1)=4096
```

```
130 LET B(2)=256
```

```
140 LET B(3)=16
```

```
150 LET B(4)=1
```

```
160 REM select
```

```
170 INPUT A$
```

```
180 CLS
```

```
190 LET Q$=A$
```

```
200 IF Q$="B" THEN GOTO 230
```

```
210 IF Q$="X" THEN GOTO 440
```

```
220 IF Q$="*" THEN GOTO 630
```

```
230 REM dec-bin
```

```
240 PRINT AT 21,0;"DEC"
```

```
250 SLOW
```

```
260 INPUT A$
```

```
270 FAST
```

```
280 IF LEN A$>5 THEN GOTO 250
```

```
290 IF A$="X" OR A$="*" OR A$="B" THEN GOTO 190
```

```
300 PRINT AT 21,0;" "
```

```
310 SCROLL
```

```
320 PRINT AT C,5-LEN A$;A$
```

```
330 LET X=VAL A$
```

```
340 FOR N=1 TO 16
```

```
350 LET Y$(17-N)=STR$(X/2)INT  
(X/2)
```

```
360 LET X=INT (X/2)
```

```
370 IF X=0 THEN GOTO 390
```

```
380 NEXT N
```

```
390 IF X=0 THEN LET Y$=Z$( TO 1
```

```
6-N)+Y$(17-N TO )
```

```
400 LET A$=Y$
```

```
410 PRINT AT C,15;A$( TO 8);" "
```

```
420 IF C=9 TO )
```

```
430 IF Q$="X" THEN GOTO 440
```

```
440 IF Q$="B" THEN GOTO 740
```

```
450 REM hex-dec
```

```
460 PRINT AT 21,0;"HEX"
```

```
470 SLOW
```

```
480 INPUT A$
```

```
490 FAST
```

```
500 IF LEN A$>4 THEN GOTO 460
```

```
510 IF A$="X" OR A$="*" OR A$="B" THEN GOTO 190
```

```
520 PRINT AT 21,0;" "
```

```
530 SCROLL
```

```
540 IF LEN A$<4 THEN LET A$=Z$(
```

```
TO 4-LEN A$)+A$
```

```
550 PRINT AT C,8;A$
```

```
560 LET S=0
```

```
570 FOR N=1 TO LEN A$
```

```
580 IF A$(N)<"0" THEN LET S=S+
```

```
(CODE A$(N)-28)*B(N)
```

```
590 NEXT N
```

```
600 LET A$=STR$(S
```

```
610 PRINT AT C,5-LEN A$;A$
```

```
620 IF Q$="X" THEN GOTO 630
```

```
630 IF Q$="*" THEN GOTO 330
```

```
630 REM bin-hex
```

```
640 PRINT AT 21,0;"BIN"
```

```
650 SLOW
```

```
660 INPUT A$
```

```
670 FAST
```

```
680 IF LEN A$>16 THEN GOTO 650
```

```
690 IF A$="X" OR A$="*" OR A$="B" THEN GOTO 190
```

```
700 PRINT AT 21,0;" "
```

```
710 SCROLL
```

```
720 IF LEN A$<16 THEN LET A$=Z$(
```

```
TO 16-LEN A$)+A$
```

```
730 PRINT AT C,15;A$( TO 8);" "
```

```
740 IF C=9 TO )
```

```
750 LET D$=""
```

```
760 FOR M=4 TO 1 STEP -1
```

```
770 LET L=M*4
```

```
780 IF VAL A$( TO L)=0 THEN GOT
```

```
0 830
```

```
790 LET S=0
```

```
800 FOR N=1 TO 4
```

```
810 IF A$(L-N+1)="1" THEN LET S
```

```
=S+VAL C$(N)
```

```
820 NEXT N
```

```
830 LET D$=CHR$(S+28)+D$
```

```
840 LET A$=A$( TO L-4)
```

```
850 NEXT M
```

```
860 IF LEN D$<4 THEN LET D$=Z$(
```

```
TO 4-LEN D$)+D$
```

```
870 PRINT AT C,8;D$
```

```
880 IF Q$="B" THEN GOTO 230
```

```
890 IF Q$="X" THEN GOTO 550
```

```
900 SAVE "CONVERT"
```

```
910 GOTO 10
```



QUICK TAPE, a machine code tape routine, will allow you to save and load 16K programs on the ZX-81 in less than a minute. In technical terms the program increases the machine baud rate to 1,500. To put in the program for the first time, type-in and run the hex loader, which is the first program in the listing. In answer to the program prompt, type-in the machine code listing line by line. When you have finished the listing, type 'S' and the machine code will be transferred to the REM statement in line 1. Then delete the loader, line by line, keeping the REM intact.

Type-in the second program, starting at line 10. The REM in line 1 should look like the REM statement which you have just created. When you run this program it will SAVE itself on to tape and then NEW automatically. The machine code routine is then stored above RAMTOP ready for use.

To SAVE a program, type RAND USE 32512 and to LOAD, type RAND USR 32525. When you want to use the program LOAD it normally and RUN. The Basic will destroy itself after transferring the machine code above RAMTOP. The routine will then be ready to use on your faster computer.

Quick Tape was sent by K S Beddoe of Botley, Southampton and is proving very useful.

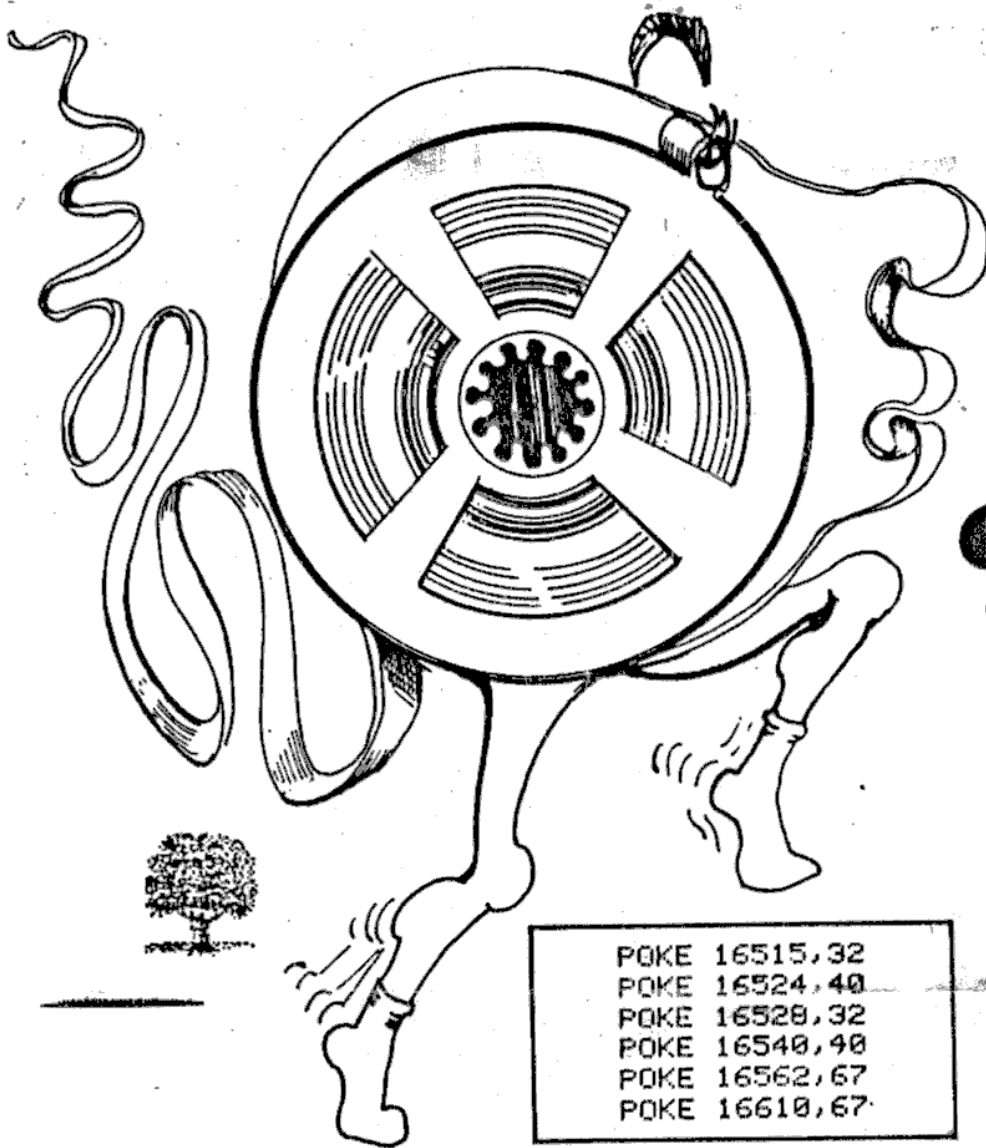
```

1 REM 240 0'S
10 LET A$=""
20 INPUT B$
30 IF B$="S" THEN STOP
40 LET A$=A$+B$
50 CLS
60 PRINT A$
70 PRINT "LENGTH= "; LEN A$/2; "
  BYTES"
80 GOTO 20
100 LET X=16514
105 FAST
110 IF A$="" THEN GOTO 160
120 POKE X,16*CODE A$+CODE A$(2
) -476
130 LET A$=A$(3 TO )
140 LET X=X+1
150 GOTO 110
160 SLOW
170 STOP

10 SAVE "FAST TAPE ROUTINE"
20 PRINT "FAST TAPE ROUTINE"
30 PRINT "TO SAVE RAND USR 325
12"
40 PRINT "TO LOAD RAND USR 325
25"
50 PAUSE 150
60 RAND USR 16738
  
```

Machine code listing

16514	CD	23	0F	11	06	7F	CD	2B
16522	7F	CD	2B	0F	C9	CD	23	0F
16530	21	1D	7F	22	16	40	CD	70
16538	7F	CD	2B	0F	C9	0B	0B	0B
16546	00	00	00	00	00	00	CD	A8
16554	03	38	F9	EB	11	CB	12	CD
16562	46	0F	30	2E	10	FE	1B	7A
16570	B3	20	F4	CD	4E	7F	CB	7E
16578	23	28	F8	21	09	40	CD	4E
16586	7F	CD	FC	01	18	F8	5E	37
16594	CB	13	C8	9F	E6	02	C6	01
16602	4F	D3	FF	06	23	10	FE	CD
16610	48	0F	30	72	06	1E	10	FE
16618	0D	20	EE	C3	D8	7F	18	E0
16626	CD	A8	03	CB	12	CB	0A	CD
16634	7C	7F	18	FB	0E	01	06	00
16642	3E	7F	DB	FE	D3	FF	1F	30
16650	40	17	17	30	28	10	F1	F1
16658	BA	D2	E5	03	62	6B	CD	7C
16666	7F	CB	7A	79	20	03	BE	20
16674	D6	23	17	30	F1	FD	34	15
16682	21	09	40	50	CD	7C	7F	71
16690	CD	FC	01	18	F8	D5	1E	31
16698	06	0E	1D	DB	FE	17	CB	7B
16706	7B	38	F5	10	F5	D1	20	04
16714	FE	56	30	B2	3F	CB	11	30
16722	AD	C9	7A	A7	28	BB	CF	0C
16730	A7	06	50	10	FE	C3	6E	7F
16738	21	82	40	11	00	7F	01	E0
16746	00	ED	B0	21	FF	7E	22	04
16754	40	C3	C3	03				



L.I.S.T

Quick Tape

AN UPDATE of the Quick Tape listing in our last issue is provided by D Buon of Shrewsbury. He points out that ZX-81 computers with the old ROM have an in-built malfunction which prevents our routine working.

If you enter "RAND USR 32512" and get a report of D/O, you have the old ROM machine and should load the Quick Tape program as normal, then BREAK, and then enter the listing published here. Finally, enter the new line "55 POKE 16437,255", start your tape deck recording, and RUN.

POKE	16515,32
POKE	16524,40
POKE	16528,32
POKE	16540,40
POKE	16562,67
POKE	16610,67



THIS COULD BE YOUR LAST COPY OF LISTING. PAY YOUR LIST DUES AND CONTINUE RECEIVING THIS NEWSLETTER. SEE FRONT COVER FOR DETAILS ON EXPIRATION DATE

TIMEX **sinclair**

L.I.S.T.

